mother remarked that the child's urine, although perfectly normal in appearance when first passed, on being allowed to cool assumed a deep colour, and stained the child's linen. He sent some of the urine to Professor Tichborne, who had made the following analysis: "The specific gravity of this urine at 60° Fahr. was 1025. Albumen was absent. It was acid to test-paper, and on standing gave a slight deposit, consisting of urate of ammonia and a little mucus. The urea was scanty, and not sufficient to account for the high gravity—it was 1.2 per cent., or 5.25 grains per fluidounce This urine presented a great peculiarity; it contained a substance which is only met with occasionally, and which has been termed alkapton. Bödeker met with a case, and Lionel Beale mentions a case in which Dr. Johnson found it in the urine of an infant. This body stains the linen, particularly when the urine becomes alkaline. It behaves like sugar, and reduces copper, and probably it may be viewed in a somewhat similar light pathologically. Estimated as a sugar, it would give about eight grains to the fluidounce. The urine was examined for the bile reactions, but gave none." Dr. Armstrong said he put some of the urine into small bottles, and having hermetically sealed them, left one exposed to light and air, and put the other into a dark place. The latter specimen, after six hours, was not changed in any way.

The Vice-President (Dr. J. W. Moore) said that, although this urine after a manner "behaved like sugar," as Dr. Tichborne's analysis stated, yet the reaction was very different. Under the influence of liquor potassæ, without the aid of heat, it struck a dark brown colour. Urine containing grape-sugar, according to his experience, did not change when liquor potassæ was added to it, except under the influence of heat. Again, with sulphate of copper the reaction of the urine was very incomplete—not at all so complete as that given by grape-sugar. The results of the microscopic examination of the deposit of the urine were completely negative; the deposit he experimented with consisted of a little mucus, epithelium, and a few small oil globules, the presence of which may have been accidental. Dr. Walter Smith tested, before the Society, samples kindly supplied to him, and pointed out that the results confirmed the statements originally made by Bödeker in reference to so-called "alkapton" in urine. These are —1. Strong alkalies darken the urine without the application of heat, and the coloration proceeds from the surface of the liquid downwards, *i. e.*, oxidation co-operates with the alkali. 2 Reduction, at least partially, of the copper test. 3. Non-fermentation with yeast. The term *alkapton* is, it is presumed, derived from *alkali* ἅπτω (fasten or bind), from its relation to alkalies; but the word conveys no real information, and was given at a time (1861) when the physiological chemistry of the urine was very imperfectly understood. From various considerations Dr. Smith thought it probable the peculiar substance or substances in the urine exhibited belonged to the "aromatic series" of chemical compounds, the physiological relations of which group have been investigated with remarkable success during the past five years. Pending further investigation it would be premature to express a definite opinion on the subject in question.—*Med. Times and Gazette*, January 21, 1882.

The Formation of Bone.

The well-known experiments of Syme in Scotland and of Ollier and Duhamel across the Channel long ago demonstrated the power of the periosteum in forming new bone. Ever since these demonstrations it has been a question whether the periosteum is the sole agent in forming the ossifying callus in cases of fracture; also whether the lymph in the medullary canal is formed *in situ*, or is forced in from without through the fissures in the bone (as maintained by Lebert and Maas).

Several series of experiments have been undertaken to settle this question, and hitherto the results arrived at have been somewhat opposing. Wegner and Busch, the one by giving phosphorus to young animals, the other by the injection of mercury into the nutrient artery of a bone, have obtained consolidation of the whole bone, while Ollier and Maas, in oft-repeated experiments on the effect of transplanting marrow under the skin, between muscles, and into a serous cavity, invariably failed to get new bone formations. Goujon, Baikow, and Bruns have all repeated these transplanting experiments, and the two latter have obtained some very remarkable results. Baikow has only published a preliminary report of his experiments, but Bruns details his results, which closely agree with those of Baikow, to the last German Congress of Surgeons in Berlin.

Bruns used young animals for his experiments, and first removed a piece of the shaft of the femur or tibia, and then by squeezing it in a vice split it longitudinally, and was so able to remove a continuous cylindrical piece of medulla uninjured This was planted in a freshly made wound under the skin, which was then carefully sutured. Out of sixty experiments in which the marrow was taken from one animal and transplanted in *another*, not once was any growth of bone found, but at the end of three to six weeks a mere shrunken trace was all that was left of the inserted tissue, which was at once destroyed by suppuration of the wound. Out of nineteen similar experiments, all performed on dogs, in which the excised marrow was planted in a wound in the *same* animal, three failed from suppuration, in four the marrow was simply absorbed without any other local result, and in the remaining twelve—or 75 per cent. of those cases where the marrow was not at once destroyed—a piece of bone about one-half the size of the transplanted marrow was formed. In these successful cases there was a good deal of swelling around the wound for a few days, but in about fourteen days this had subsided, and by puncturing the nodule left, bone could be detected. The ossification was found often to commence in several centres, which blended into one about the twenty-first to the twenty-fourth day. A microscopic examination of the specimens at various stages of development showed that during the first fortnight the marrow is infiltrated with cells which first appear at its circumference; these quickly assume spindle shapes, and lying in bundles divide the marrow into small communicating spaces. By the absorption of the round marrow cells and fat cells these spaces gradually shrink. At the end of this period the bone first appears, and with it are seen hyaline cartilage and osteoid tissue, and Bruns thinks the bone is formed partly directly from osteoid tissue and partly by the ossification of cartilage. The piece of bone that is ultimately formed has a compact outer layer, is cancellous within, and possesses all the characters of normal bone. But appearing in the cancelli in increasing numbers, as time passes on, are seen often very large giant cells, as if the process of bone absorption quickly followed bone formation, and might ultimately destroy the bone. It was found that the result was the same, whether young red or mature yellow marrow was transplanted, and also that if spongy bone tissue was used in the experiment scarcely a trace of bone formation was found, while after two or three weeks the trabeculæ were thickly set with giant cells, and underwent absorption. These experiments show that bone marrow, when transplanted in uninjured continuous pieces into the same animal, not only has the power of forming cartilage and bone, but that, when not quickly destroyed by suppuration or absorbed, it does not form any other tissue. They so far set this question at rest. But the fact, that to succeed, the two parts of the experiment must be performed in the same animal, is of extreme interest, and seems difficult to explain.—*Lancet*, Dec. 10, 1881